

Having described the invention, we claim:

1. A system for operating a wireless ad hoc network, said system comprising:
  - a plurality of nodes; and
  - an active packet for implementing a genetically programmed adaptation of one of said plurality of nodes in response to a change of condition of said one node of said plurality of nodes.
2. The system as set forth in claim 1 further including a functional unit injected into said active packet.
3. The system as set forth in claim 2 wherein said functional unit remains inactive until a fitness function is injected into said one node of said plurality of nodes.
4. The system as set forth in claim 3 wherein said fitness function allows functional evolution of said plurality of nodes.
5. The system as set forth in claim 4 wherein said system genetically modifies itself to meet a specific fitness criteria.

6. The system as set forth in claim 5 wherein said active packet performs a mutation operation for generating a single parental program.

7. The system as set forth in claim 6 wherein said single parental program has been probabilistically selected based on fitness.

8. A computer program product for evolutionarily adapting a network, said computer program product comprising:

a first instruction for implementing a genetically programmed adaptation of one of a plurality of nodes in response to a change of condition of the one node of the plurality of nodes, said first instruction being executed by an active packet; and

a second instruction for injecting a functional unit into the active packet.

9. The computer program product as set forth in claim 8 further including a third instruction for probabilistically selecting two parental programs based on fitness.

10. The computer program product as set forth in claim 9 wherein the two parental programs have different sizes and shapes.

11. The computer program product as set forth in claim 8 further including a fourth instruction for continuously evaluating the functional unit.

12. The computer program product as set forth in claim 11 further including a fifth instruction for maintaining a population of structures that evolve according to rules of selection and genetic operators.

13. The computer program product as set forth in claim 12 further including a sixth instruction for classifying functional units within functional unit classes.

14. The computer program product as set forth in claim 13 further including a seventh instruction for enforcing minimal requirements on an execution environment of the network.

15. A method for adapting a network, said method comprising the steps of:

operating a plurality of nodes;

implementing a genetically programmed adaptation of one of the plurality of nodes in response to a change of condition of the one node of the plurality of nodes;

executing said operating step by an active packet;

injecting a functional unit into the active packet; and

probabilistically selecting two parental programs based on fitness.

16. The method as set forth in claim 15 further including the step of publishing the state of each of the plurality of nodes to the other nodes.

17. The method as set forth in claim 16 further including the step of predicting a state of the network.

18. The method as set forth in claim 17 further including the step of querying the network to verify the accuracy of said predicting step.